

1 **51306/WGM/W277**

ABSTRACT OF THE DISCLOSURE

5 A steering tool for extended-reach directional drilling
in three dimensions comprises a mud pulse telemetry section, a
rotary section, and a flex section assembled as an integrated
system in series along the length of the tool. The flex
section comprises a flexible drive shaft and a deflection
10 actuator for applying hydraulic pressure along the length of
the shaft for bending the shaft when making inclination angle
adjustments during steering. The rotary section comprises a
rotator housing coupled to the deflection housing for rotating
the deflection housing for making azimuth angle adjustments
during steering. The onboard mud pulse telemetry section
15 receives inclination and azimuth angle steering commands
together with actual inclination and azimuth angle feedback
signals during steering for use in controlling operation of
the flex section and rotary section for steering the tool
along a desired course. The steering tool can change
20 inclination and azimuth angles either simultaneously or
incrementally while rotary drilling.

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AGJ PAS532828.1-*--10/22/03 2:01 PM

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